gap plate was extended by a metal rod, extending to within a few centimetres of a narrow orifice, through which issued a jet of water vapour from a small boiler. The boiler was heated electrically in order to avoid the production of disturbing ions through combustion.

The steam remained almost invisible so long as the induction coil remained inoperative, but, as soon as the helix interrupter was started and the intermittent electric field established around the metallic rod, the appearance of the steam jet changed, its visibility fluctuating in synchronism with the dipping of the Roget interrupter and with the polarity of the electric field. When the vertical rod was positively electrified the phenomenon was strongly marked, but when the conductor was charged negatively the results were not readily observable.

Although this simple experiment did not reproduce fully the conditions obtaining on the electric railway, it illustrates and corroborates the hypothesis of the alternate condensations and rarefactions being caused by the alternating electric field.

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Intensities in Band Spectra.

THE correspondence principle alone is not sufficient to determine accurately the intensities of spectral lines for small values of the quantum numbers. But, as recent investigations have shown, it seems that, in the case of multiplets, this is possible with the aid of the rules found by H. C. Burger and H. B. Dorgelo (*Zeit. f. Phys.*, 23, p. 258, 1924), which state that the sum of the intensities of the lines coming from (or going to) a certain level must be proportional to the inner quantum number (= statistical weight) of this level.

It is to be expected that these rules will also hold good for band spectra. Some of the results obtained by applying them to the lines of a band are summarised below.

(1) In a band with only a P- and R-branch without fine structure the intensities are, if the statistical weights a priori are $2m-1$, proportional to:

$$\left.\begin{array}{rcl} m \rightarrow m+1 & : & m e^{-E_m/kT} \\ m+1 \rightarrow m & : & m e^{-E_{m+1}/kT} \end{array}\right\} \quad . \quad . \quad . \quad (1)$$

For small rotational quantum numbers the intensities are symmetrical with respect to the missing zero line.

(2) The P-branch is somewhat more intensive than the R-branch, the quotient for the two maxima being $e^{\sqrt{2\sigma}}$, if the rotational energy can be represented by $E_m = \frac{h^2}{8\pi^2 J} m^2$, and we put $\frac{h^2}{8\pi^2 JkT} = \sigma$.

(3) If the band lines are non-resolved doublets as, for example, in the CN-bands, the intensity distribution must be another one, as in the case of true simple lines. With the interpretation of the fine structure given by A. Kratzer (*Ann. d. Phys.*, 71, p. 72, 1923), or an alternative one proposed by the present writer (*Physica*, 5, 1925), the factor m in (1) must be changed by $2m-1$.

(4) In such bands as the CN-bands, one or more lines in the neighbourhood of the zero line are simple instead of unresolved doublets. Such lines are not weaker than would be expected from the neighbouring lines, but have the normal intensity.

(5) There are some possibilities which give alternating intensities, as observed, for example, in the nitrogen and hydrogen bands.

Equation (1) is the same as that found by E. C. Kemble (*Phys. Rev.*, 25, p. 1, 1925) in removing the degeneration of the two rotational degrees of freedom by an external field and applying the correspondence principle to the non-degenerated system. Such a procedure gives a better approximation to the true intensities also in the case of a multiplet, as was shown by E. Fermi (*Physica*, 4, p. 340, 1924), but it remains an approximation. Besides, it is necessary to know how the system behaves in an external field, and as to molecules we know nothing certain about this point.

Accurate quantitative measurements of intensities of band lines do not exist. The results are, however, in good qualitative agreement with the observations. If an application of the rules of Burger and Dorgelo to band lines is justified, intensity measurements will be of very great value in determining the structure of band spectra.

A more detailed account will be given elsewhere.

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Leyden, April 27.

The Word "Australopithecus" and Others.

IT has been stated by several critics that the word "Australopithecus" is a hybrid (Latin-Greek) term. I am indebted to my colleague Mr. T. J. Haarhoff, professor of classics in the University of the Witwatersrand, for the information that *pithecus* was a recognised naturalised Latin word in Rome. It was used by Cicero's own secretary Tiro and by other accredited writers, and more than a century before Cicero's time Plautus employed the diminutive *pithecium*. It is, therefore, not surprising that both of these words are to be found in a standard Latin dictionary, such as that of Lewis and Short. The still commoner *cercopithecus* is found in Pliny, Varro, Juvenal and Martial, to the last-named of whom (Book xiv. Epigram 202) we owe one of the most pleasing examples of the indiscriminate juxtaposition of the two words used by polished Romans for a monkey:

> Callidus emissas eludere simius hastas
> Si mihi cauda foret cercopithecus eram.
>
> "A monkey, cunning to avoid darts, hurled at me (the charge that)
> I should be a tailed ape, had I a tail."

With regard to Homosimiidae versus Hominisimiidae, surely the word is parallel with any other double nominal term such as Pithecanthropus or Anthropopithecus. In defence of the introduction of the term Homosimiidae instead of Australopithecidae little need be said since the group intermediate between true apes and true men must have been man-apes and not all necessarily, much as one may anticipate the discovery, southern-apes.

RAYMOND A. DART.

Photo-electric Cells for Colour-matching.

I NOTICE in your description of the exhibits at the Royal Society Conversazione in NATURE of May 23, p. 820, a brief mention of the method of colour-matching lamps by means of alkali photo-electric cells, shown by the National Physical Laboratory. As stated in the programme of the Conversazione, this method of colour-matching was first developed by the staff of the Research Laboratory of the General Electric Co., who kindly made for us the cells used, which are now being shown in the Royal Society's exhibit at the British Empire Exhibition. I shall be glad if you will allow me the opportunity of making this acknowledgment in your columns.

J. E. PETAVEL,
Director.

The National Physical Laboratory,
Teddington, Middlesex,
May 26.